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ABSTRACT

The effects of university education in economics on students' conceptions of economic aspects of their everyday life were studied. A random sample of 15 beginning students at the University of Goteborg, Sweden, were interviewed before and after the course. Ten questions were asked that were taken from the students' everyday life and brought out basic economic concepts (e.g., the concept of price, the function of money, elasticity of price, and devaluation). It was found that the students' conception of each principle, before as well as after their studies in economics, could be described in terms of a limited number of categories, denoting qualitatively different ways of comprehending the particular principle or concept. Even if identical categories were found before and after, there was a certain difference in the distribution of subjects over these categories. The difference can be regarded as a measure of the effects of education. There was a marked difference between the answers given before and after studying economics, but this difference in many cases was restricted to the word level (i.e., the students tended to change their vocabulary even if they exhibited the same basic conception of the principles). (SW)

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EFFECTS OF UNIVERSITY EDUCATION ON THE CONCEPTION OF REALITY

Paper to be presented at the Fourth International Conference on Improving University Teaching. July 26-29, 1978, Aachen, F.R. Germany.

Lars Owe Dahlgren

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No 65 May 1978

Investigations into the learning and teaching of basic concepts in economics. (8)

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EFFECTS OF UNIVERSITY EDUCATION ON THE CONCEPTION OF REALITY

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Abstract

The study reported here was carried out within the framework of a research project on learning and teaching in Economics at university level. The purpose of this particular investigation is to study the effects of university education in Economics on students´conceptions of economic aspects of their everyday life.

A group of beginners, consisting of 15 students, were picked randomly. The group was interviewed both at the beginning of the term (i. e. before the course started) and at the end. Each subject participated in individually administered oral in depth interviews. Ten so-called everyday economic questions were asked, i. e. questions which, as regard content, were taken from the students´everyday life and brought basic economic concepts to the fore (e.g. the concept of price, the function of money, elasticity of price, devaluation). The main criterion when selecting a concept for inclusion in the study, was that it should be familiar to people in the street.

When analysing the transcripts of the interviews, it was found that the students´conception of each principle, before as well as after their studies in Economics, could be described in terms of a limited number of categories, denoting qualitatively different ways of comprehending the particular principle or concept. Even if identical categories were found before and after, there was a certain difference in the distribution of subjects over these categories. This difference can thus be regarded as a measure of the effects of education in this respect. In spite of this difference, there was, however, a considerable amount of over-lap. Certainly, there was a marked difference between the answers given before and after studying Economics, but this difference in many cases was restricted to the word level so to speak, i.e. the students tended to change their vocabulary even if they exhibited the same basic conception of the principles.

The main argument of the present paper is twofold:

1. The effects of education should be studied in terms of changes in the participants´conceptions of those aspects of reality which their studies concern.

2. By using the qualitative approach described here, such effects can be separated from more superficial ones, such as rote learning of scientific terms or forms of expression.

Background and purpose

Evaluation is a continuing activity in higher education, as well as at any stage of the educational system, appearing in the form of examinations. This type of knowledge about the effects of education is above all characterized by three features.

a. It is internal in the sense that the content and context of items presented in examinations can most often easily be traced back to a specific part of the course in question.

b. It is quantitative in the sense that it is designed to give answers to questions such as "How large a proportion of the course content is mastered by pupil A" or "Which one is the superior of pupils A and B".

c. It is primarily focused on short term retention since the examination generally follows very closely the course that it is aimed at evaluating.

The aim of the present study is to describe effects of education on a somewhat different level than is brought about by teachers in regular examinations. In contrast to the three main characteristics mentioned above, this study was designed as an external evaluation in order to shed some light upon what might possibly be longlasting effects of education in the form of qualitative changes of the students' conceptions of basic phenomena in the surrounding world.

From earlier studies (e.g. Dahlgren, 1975, Säljö, 1975, Svensson, 1976, Marton et al, 1977) it has been evident that qualitative differences in people's conceptions of phenomena that they read or hear about, or in other ways

get experience of, may be of greater importance than quantitative differences, i.e. from many points of view the question of what is learned seems to deserve more attention than the question of how much is learned.

The question about what is learned, however, requires that the conception about a phenomenon held by someone before a learning experience can be registered and characterized as well as the conception held after the learning has taken place. Furthermore these conceptions have to be described in terms of their content without applying any à priori formulated apparatus of analysis. The notion that learning is an activity that can be temporarily limited by stating the exact points of beginning and termination is a very dysfunctional simplification. In most cases we have some conception about what we start to learn more about. The essential effects of learning should not be considered as a growth from a zero point towards some amount of knowledge but as the rise - or, if required, change - of a conception about that phenomena in, or aspect of, the surrounding world that is actualized. Marton (1976) at an earlier IUT-congress developed this qualitative conception about learning to a point where the traditional division between knowledge and skills seemed to be an artifact of an earlier quantitative and superficial conception of learning. On the whole knowledge is often given a too passive conotation in theories of learning and the existence of some kind of independent "unit" operating on the body of knowledge is easy to identify e.g. in the human information-processing theories of human cognitive skills. Our standpoint is that structural properties of human cognitive functioning is determined by qualitative properties of the content of conceptions held about the world around. This is the theoretical rationale for the design and choice of problem in the present study.

An intuitive conception about the effects of formal education is that it affects on its participants on different levels. On the one hand, a person with a specific education can be identified by tangible characteristics of which a

certain vocabulary may be the most prominent. On the other hand, the effects may be more subtle and consist of a certain pattern of reasoning, way of solving problems, or a specific way of apprehending concepts and principles.

Educational goals are often described in the form of expected effects on different levels ranging from knowledge about specific facts to insight into complex relationships.

However, on whatever level we choose to describe educational goals it is the aim of all education to bring about a more thorough understanding of the phenomena brought into focus.

To different subject matter areas there is a corresponding aspect of - or domain in - reality that is the object of that particular subject. If learning has been successful, it would be possible to observe a change in the way the participants conceptualize phenomena belonging to the domain that is paid attention to between two observations separated by a period of learning activities.

In the following, I intend to present a report on some results of a study of changes in conceptions of some economic phenomena of everyday life held by students of economics as a result of a one term course.

Method and subjects

A group of 15 randomly chosen freshmen at the Institute of economics at the University of Göteborg were asked to participate in the study. The only criterion for being included in the study was that the subjects should not have any earlier formal education in economics or related subjects such as business administration or the history of economics.

In individually administered interview sessions they were presented ten questions referring to familiar concepts in economic life such as prices, wages and taxes. The aim of

each question was to arrive at an understanding of how the concepts involved were apprehended.

The questions were presented once more at the end of the course. Of the orginal 15 subjects, 13 participated on this occasion.

Results

The results are of two different kinds. On the one hand, it was possible to describe the conceptions by means of a limited number of categories. These categories were however not a priori deduced, but were the result of an endeavour to establish groups of answers expressing a common underlying conception of a phenomena and thus to delete the linguistic differences on the surface level of the answers.

On the other hand, the qualitatively different categories of conception were relevant when describing the variation between the answers on both occasions, i.e. differences between a specific student's conceptions at different points of time could be described by using the same categories that were used to characterize the variation between students on the first (or at the second) occasion.

Thus, it is also possible to separate superficial changes between answers given at two different points of time, i.e. differences in language usage, from differences on a deeper level, i.e. conceptions.

For spatial reasons three of the ten questions presented will be analysed in the following.

The first question to be described was formulated:
"What is the meaning of the statement that too high wage increments will cause inflation?"

The concept of inflation is a classical one in economics. Ever since Columbus' travels, the undesired effects on price

level of discrepancies between the amount of currency and the amount of commodities have been in evidence.

A qualified economist would probably answer that a single mechanism in this problem is hard to identify, but that two consequences may interact, namely: B. The increment of wages would, in the event that the production does not increase correspondingly, raise the costs for the producer, who would cover these increased costs by raising the prices of his products and A. The increment of wages would also, if it is too large i.e. exceeds the increment of production, cause an increment of demand that can not be totally covered by the avaible supply. In this situation the producers would probably raise their prices, because there would be a kind of competition between the consumers rather similar to an auction where he who pays best gets the product.

In economic jargon the B-case is called cost-push inflation, while the A-case is usually denoted demand-pull inflation.

The two explanations above were also found among the students' answers (but never a combination of them). Although it was not intended that A should be a "better" answer than B, we chose to let it introduce the list of categories. After each category we also give some examples of answers that have been placed in the category in question.

A. "The amount of money can increase to the extent that it exceeds the amount of goods."

Examples:

Subject 1. (first interview)

"... the assumption behind the question is that more money crops up on the market so that the purchasing power will be greater than production can cope with and you get a rise in prices there."

Subject 3. (first interview)

" ... if there are too few goods on the market and demand increases if production can´t catch up."

Subject 1. (second interview)

" ... The person who said that means that if wage increases are larger than the increase in productivity in the sector it refers to, then there will be inflation. That is to say, greater purchasing power than production."

Subject 3. (second interview)

"Purchasing power can increase more than production ... that is, purchasing power becomes to great in relation to the goods produced ... and then prices are raised."

The demand-pull inflation mechanism constitutes the basic structur of the A-answers. One of the most famous examples in modern time of demand-pull inflation is the situation in Germany in the 1920ies:

> *"Thus, in 1922 the German central bank prints off trillions and trillions of paper marks and these come into the market place in search of bread or housing, it is no wonder that the German price level rises trillionfold. This is demand-pull inflation with a vengeance. But the matter would not be essentially different if there were an 1849 gold discovery in California. Or if the World War I Federal Reserve System created new currency and bank deposits in large enough amounts to bring the system past the point of full-employment spending."* (Samuelsson, 1973, p 826).

The next category is:

B."A wage increment will increase the costs for production which has to be covered by a price increment."

Examples:

Subject 5. (first interview)

"Ye-es ... prices go up all the time when wages rise.
E: Why do they do that?
Well, because the producers have to raise their prices when the wages go up all the time in order to be able to pay them."

Subject 6. (first interview)

"Well, if the company pays more in the form of wages there will be increased production costs, of course, and it´s the prices that´ll have to go up."

Subject 5. (second interview)

"Well, it pushes up the prices because the companies have to higher wages so they raise their prices. That the reason is this. It gets into a sort of circle thing."

Subject 7. (second interview)

"It means that when production costs go up because wages rise, then prices go up too. But then, what it´s like in practice is much more doubtful, even among bourgeois economists."

These four examples all contain the cost-push inflation mechanism.

> *"In pushing for higher wages, labor is pushing against an open door. The employers do not fight the increases the way they used to. They act as if they think the Treasury and the Fed will keep aggregate demand high enough to buy the higher cost output; so they grant the wage increases, and this sends up costs of production, which sends up the prices that firms charge for their goods. The result is a new kind of inflation."*
> (Samuelsson, 1973, p 828)

The basic structure in the B-answers is that a producer perspective is applied to the concept of wages. The human labor-force belongs to the production factors and as such it has a price which means that wages have to be included in the costs of production.

The basic structure in the third category is:
C. "If wages increase prices will increase"

Examples:

Subject 2. (first interview)

"Well, wage increases and price level, yes, I suppose they go together too. If wages increase then prices increase too."

Subject 8. (second interview)

"When wages rise, prices rise.
E: Why do they do that? The prices, that is ...
Well, I suppose a wage increase is the result of a price increase.
E: Yes, but in what way?
Because it gets more expensive to live and to manage so they have to have higher wages to be able to live at the same level as they did previously."

Subject 17. (second interview)

"The effective value doesn't improve.
E: What do you mean by the effective value?
Everything, as it were, that the effective value of everything, that is, it doesn't improve.
E: No. You mean that it's inflation?
Yes. Inflation is, I suppose you could say, the deterioration in the value of money and because of the deterioration in the value of money it doesn't get any better. Instead, wages are forced up in relation to goods etc.,

This falls in a kind of restatement category, i.e. the answer does not contain any more than an alternative way of expressing the problem that was orginally in the question. Such restatements have been found in earlier research to be a fairly general strategy of answering questions (cf Dahlgren, 1975, Säljö, 1975)

The fourth category is:
D. "When purchasing power increases it is possible to raise prices as well."

Examples:

Subject 13. (first interview)

"Yes, it means that the more money people have the more they can afford to pay for certain things ... the more one can afford to ... or I´d say that the seller can raise the price of his goods without sales diminishing"

There were no answers of this kind on the second occasion.

This kind of answer reveals that the concept of inflation is not understood. Inflation is seen rather as an adjustment of prices to a de facto increment of purchasing power reflected by an increment. One ignorant answer is also included in this category.

Three subjects, whose answers had been classified as A-answer at the first interview, gave A-answers on the second occasion, while one of them gave a B-answer. Of the six subjects in B at the first interview four also gave B-answers at the second interview. Two of them were A-respondents in the second session. Two of the three C-subjects at the first interview gave C-answers one term later and one was classified as an A-answer. The single D-answer at the first interview had changed into a B-answer at the second interview.

Although the mechanism of inflation constitute a very central topic in the course, the education does not seem to have had any more thorough effect on the students´conceptions.

Another of the questions was formulated: "What would be the consequences for the Swedish labour market if England devaluated the pound in relation to the Swedish crown?"

This problem was put in order to describe the variations in the students´conceptions of devaluation. Thus, we were not primarily interested in whether the students were able to

explain the consequences of this kind of measure for the labour market in Sweden.

The underlying structure in the concept of devaluation is that it is a change in the relationship between two different currencies. The price of a commodity is primarily expressed in the currency of the country where it is produced. This means that the relationship between domestic commodities and domestic currency is not changed. Devaluation (or revaluation) means, instead, a change in the relationship between foreign commodities and domestic currency and between domestic commodities and foreign currency. The devaluation described in our example would thus result in British goods being cheeper in Sweden and Swedish goods being more expensive in Great Britain, since devaluation means the decrement of the value of a currency in relationship to other currencies.

This structure is also found in the answers which have been placed in the first category.

A. A devaluation of the British pound could make British goods cheaper in Sweden and Swedish goods more expensive in Great Britain.

Examples:

Subject 1. (first interview)

"It can mean that there´ll be employment problems in the Swedish market if exports to England diminish because the Englishmen´s purchasing power in comparison with Swedish prices diminishes as it were ... then English things will be cheaper on the Swedish market and then Swedish production would also diminish, naturally, in the long run."

Subject 5. (second interview)

"Well, there would be a negative effect on Swedish trade with England in that it would be more expensive and, the goods Sweden exports to England would be more expensive

and then the opposite since the goods Sweden imports from England would be cheaper".

The A-category is characterized by the consideration of the doublesided effect of a change in exchange rates. This is what distinguishes A-answers from B-answers.

B. "A devaluation of the British pound
would make British goods cheaper in Sweden
or
would make Swedish goods more expensive in Great Britain".

Examples:

Subject 15. (first interview)

"Yes, exactly, it would mean that the Swedish goods that are sent to England would be more expensive for the English and it would mean that there would be a smaller demand for Swedish goods and that would lead to lower production but it depends on the size of the part of England responsible for Swedish goods etc. ...".

Subject 4. (second interview)

"We´ll have ... or the British will have to pay a proportionately higher price, if one says that one has two cars, an English and a Swedish and both cost the same in the beginning, but then it´ll be devalued, the pound, so the Swedish car will be more expensive than the English ... which is why one prefers the English, if they are equally good in other ways".

Six subjects gave A-answers at the first interview. Four of these gave similar answers at the later interview, while two had moved into the B-category, of the seven B-answers, six gave B-answers at the second interview while one gave an A-answer.

The general change at group level is very marginal. Although there are movements between the categories between the two occasions the net effect is not particularly positive.

A third question that will briefly be described here concerns the nature of the concept of price. (The qualitative differences in the conception of price have also been described by Dahlgren & Marton, 1978)

"Why does a bun cost 50 öre (Swedish)?"

The concept of prices is perhaps the most central in economics and the derivation of price has been - and still is - a great challenge, even to very sophisticated scholars in the field.

As compared to the other two examples the answer given by a group of professional economists would probably be more hesitant.

Everyone would probably agree that price is a function of demand and supply, but the complicated economic reality in the societies of today blur the picture by taxes, state regulations, subventions, official support in periods of unemployment, the existence of planned economies, etc.

Among the students´answers we find the two aspects of price that have dominated throughout the history of man´s interest in economic affairs. Once more I would, however, like to point out that the categories are purely empirical and that the various conceptions held by economic scientists at different points of time have not been applied as analytical instruments.

A. Price is a function of demand and supply.

Examples:

Subject 1. (first interview) 16

"If we take this competition model so as to say, then a

balanced supply and demand meet there at that point. That´s a simple answer, isn´t it"

Subject 15. (second interview)

"It determines supply and demand, that is, what people are willing to do at a certain cost, and if people are willing to buy at this price. Yes, that is, it is supply and demand that set the price of goods"

B. Price is determined by costs.

Examples:

Subject 8. (first interview)

"It´s the production value, what it costs to ...
E: Can you tell me what this price consists off? How it was established?
Well, the farmer must be paid for his fluor so he refines it and sends it to the baker who refines the bun. Or the grain into flour"

Subject 5. (second interview)

"Well, the production cost, materials and labour, profit.
E: What determines the price of these raw goods and labour costs?
Well, the market price"

The A-category is characterized by a more abstract conception of price. It is thus most often a conception that considers a commodity as a whole. The B-category, on the other hand, is more concrete and generally, the answers in this category contain an additive conception of price since they mean a division of the commodity into its constituents.

Six subjects gave A-answers at the first interview. Of these three were still found in this category at the second interview, while three were classified as B-answers. Of the seven B-answers, six remained in the B-category while one changed into the A-category.

Even on this question there is a small difference on group level between the two interviews.

Discussion

Above, we have described three of the ten questions included in an interview carried out before and after one term's studies of economics at university level. The main trend in the outcome to the other questions is identical so that observed in the examples provided here. The aim of the study - which is part of a research project on teaching and learning in economics - is to study the effects of this formal education on the students' conceptions of the phenomena referred to.

At this level, the effects seem to be limited. Although there are changes at the individual level it is probably impossible for an independent co-judge to decide which of the two sets of interviews was made before or after formal studies in the subject.

This, obviously, does not exclude the existense of other effects. It is, however, to some extent discouraging that students participating in one term of full-time studies in economics do not change their conceptions of price, taxes, inflation, etc, in a more profound manner.

It is, however, possible to trace educational effects on a more superficial, linguistic level in the answers. In other words, the students in several cases express identical conceptions before and after the studies, but the interspersion of technical terms is more obvious at the second interview.

A more systematic compilation of linguistic differences shown by a student between the two interviews is somewhat complicated to carry out, not the least for methodological reasons, but the nature of the change is easily illustrated by some examples.

First interview

Subject 8.

"When wages rise, prices rise .... everybody wants higher wages.
E: And why do prices rise when wages rise?
Well, for example, a tradesman also has to have higher wages ... then he can raise his prices".

Second interview

Subject 8.

"When wages rise, prices rise.
E: Why do they do that,the prices, that is?
Well, I suppose a wage increase is the result of a price increase.
E: Yes. But in what way?
Because it gets more expensive to live and to manage so they have to have higher wages to be able to live at the same level as they did previously.
E: Yes. But why does it get more expensive to live?
Different economic factors.
E: For example what. What affects the price etc?
Fluctuations in the economic situation and the interest rate.
E: Well, why not wages for example?
No, I see wages as being the result of the others".

The conception of the reason for inflation did not change between the two interviews, but the interspersion of economic jargon is more striking at the second interview.

Another example is the answers provided by subject 14 on the question about the effects on the Swedish economy of a devaluation of the British pound.

First interview

Subject 14.

"Well, I don´t really know.
E: Do you know what devaluation means?
Yes, they depreciate the value of the pound ... so that we can buy more pounds for our money.
E: How do you think it can affect Swedish exports and imports?
For Swedish imports we get more goods for the ... that is, we get more, the same as we pay we get more, I mean, and exports ... I don´t know ..."

Second interview

Subject 14.

"If England devalues the pound it will result in their exports being cheaper in Sweden.
E: What effect do you think it will have on the Swedish labour market?
Then they will begin to compete with Swedish production and then perhaps England can manufacture things cheaper than we can and that means that our companies perhaps ... that we´ll have to cut down production so that they´ll have to lay off workers."

A third example comes from subject 12 and the answers given to the question about the price of buns.

First interview

Subject 12.

"Yes, that´s all that ... how much you have to pay in wages to those who made it and then what the raw goods cost ... machines and the things they used, what it costs

and then sell it in a shop".

Second interview

Subject 12.

"Because the costs of producing this bun are about 50 öre, with labour and normal profits on sales".

The list could be made considerably longer, but for spatial reasons will be concluded here.

A summery of the fragmentary picture of results that have been described here may be seen as very pessimistic.

It has been my intention to point to the fact that the picture of higher education obtained from looking through the textbooks or from a glance at test may be somewhat missleading as concerns the effects of higher education on the understanding of more fundamental problems.

A second point is of a more principal character. The effects of education are seldom - not to say never - studied by investigating qualitative changes in the participants´conceptions of principles and phenomena brought to the fore.

In the introduction we formulated the purpose of this study as a search for what might be considered enduring effects of education in the form of qualitative changes in the students´conceptions of phenomena dealt with in the teaching and course literature. We found that effects on this level seem to be very marginal after an introductory course in economics at university level. We used a limited number of questions and asked relatively few students which, of course, has to be kept in mind when judging the results. The general trend is, however, similar for every question and the intensive data obtained gives a striking impression of a more superficial, primarily linguistic change.

University courses, especially introductory ones, are generally quantitatively overloaded with concepts and principles. The application of a learning strategy aimed at an in-depth understanding of the content will, in this perspective probably result in the student not having sufficient time to study the course literature and thus failing in the examinations.

A more successful strategy is instead to concentrate on the more prominent features of the texts which are mostly identical to the terminology of a discipline. This is one possible explanitation of the results. Another type of explanatation is that students make a distinction in their thinking between concepts and principles dealt with in the studies and phenomena in reality. Lybeck (1978) found that secondary school students give different explanations to physical phenomena in school situations and in problem situations outside the school. It is reasonable to assume that a similar way of function also takes place among university students. A failure of the educational system to introduce concepts and principles in such a way that they are easily recognizable by the students against the background of their own experience is a serious symptom of its general lack of relevance to reality as it is experienced by the students or, indeed, by anyone.

Qualitative changes of the students´conceptions about some phenomena brought to the fore in an introductory course in economics were found to be very marginal.The main change is instead of a terminological character. In fact, we have thus found that the kind of effects we were interested in describing may not be the predominating. If this is representative of educational effects in general, it would reasonably lead to a reflection on the way the content and forms of education are chosen.

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